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pins or brads thrust into the sides of the case, and if equal in width to the depth of the case are held down by the cover, or they may be narrower and then held securely in place by a pin above each end.

For examination the case may be placed upon a table covered with white or dark cloth or paper according to the background desired, and may be instantly turned upside down, allowing both sides of the entire series of specimens to be examined when desired without a moment's delay.

A NEW GLOVERIA.

By HARRISON G. DYAR.

Mr. L. O. Howard has sent me several examples of a *Lasiocampid* collected in Arizona for the Department of Agriculture, which seems to represent an undescribed species. I take pleasure in dedicating it to this well known entomologist.

***Dendrolimus howardi*, sp. nov.**

Female. Like *Quadrina diazoma*. Clay color (Ridgway, pl. V, fig. 8) irrorate with pale chocolate brown scales. Two faint, brown, nearly straight lines, one across the cell, the other at the outer third of the wing, the most distinct mark. A very faint white discal dot. Subterminal line irregular, broken, faint, twice outwardly curved, at veins 3 and 4 and 6 to 8. Secondaries and thorax pale brown, about the tint of the transverse lines of the primaries; abdomen a little paler. Expanse 49 to 66 mm.

Male. Considerably like the male of *D. gargamelle* Strecker (The male of *Q. diazoma* being unknown). Sepia (Ridgway, pl. III, fig. 3), along the outer margin of primaries succeeded by a semi-transparent zone, which shades into raw umber (R. III, 14) over the basal half of the wing, composed of brown and yellowish hairs. Discal dot round, distinct, white. Lines as in the female, faint, darker than the wing, the subterminal especially obscure, broken into a series of brown intervenular dots, the one at the anal angle the most distinct. Secondaries sepia, a semitransparent space covering the outer third except for a narrow outer margin. Body dark, mixed with yellowish hairs. On the primaries the subterminal line is much fainter than in *gargamelle*; the transverse space encroaches on it whereas in *gargamelle* it just reaches the line. Basally in both it reaches to the discal dot. The bright yellowish costal shade is not present in *gargamelle*. The secondaries dark chocolate, not bright reddish brown; the transparent space reaches out further than in its ally, leaving only a narrow band instead of an outer third. Expanse 38 to 45 mm.

The types are three pairs in the National Museum and one pair in my collection. All bred specimens.

In markings the female is perhaps not different from *Quadrina diazoma*.

Grote, the type of which is rubbed and the faint transverse anterior line and discal spot may have been obliterated, not being mentioned in the description. The wings are, however, clearly not short and broad as described (and as shown also in the photograph before me); but are, as usual, rather long, the outer margin gently convex. The size, too, is much smaller; but the specimens may have been reduced by breeding, although Mr. Howard does not think that this can be the case to any great extent. Otherwise this form is distinct from any in our fauna, nor is there anything like it in the *Biologia Centrali-Americana*. Mr. Druce and Mr. Schaus have both described several *Lasiocampids* since the date of the *Biologia*; but a perusal of their descriptions does not suggest that any of them have to do with the present insect.

Synopsis of the American Dendrolimus ♀ ♀.

Gray, the subterminal line distinct.

Subterminal line sharply and regularly dentate..... **arizonensis.**

Subterminal line undulate, irregular..... **dolores.**

Brown-gray to yellowish brown, subterminal line obscure.

Dark grizzled gray brown, discal dot white..... **gargamelle.**

Paler, luteous brown, only traces of discal spot.

Wings as usual, rather elongate..... **howardi.**

Wings short and broad, depressed at apices..... **diazoma.**

The following notes, sent me by Mr. Howard, show the dates observed for the emergence of the moths as bred at Washington.

"April 10, 1895. Received from J. W. Toumey, Tuscon, Arizona a web of a *Lasiocampid* and some partly grown larvæ found feeding on *Quercus emoryi*; only observed on a few trees. Accompanying them was a strip or band of web taken from the tent. Mr. Toumey has been informed that great bands of such web hang from the branches immediately around the tent like long streamers.

The larvæ are bright ferruginous with a yellowish lateral stripe and dull black head.

There are three median dorsal rows of white soft hairs and a lateral row of same color.

April 20th. Larvæ are feeding both on buds just opening as well as on the dry leaves of oak. One tachinid fly issued; it is *Exorista thlecarum*.

July 1st. One larva spun up.

July 10th. One moth, a female issued.

July 16th. Five males issued; two were ruined, the remaining three spread.

July 18th. One female issued ; left in cage to copulate.

July 19th. Two females and four males issued. Eggs were deposited in the cage.

July 22d. Three females and five males issued. Two more batches of eggs deposited.

July 23d. Three females and two males issued.

July 24th. One female and one male issued. More eggs were deposited.

July 25th. Two males issued.

July 26th. One female issued.

July 29th. Two issued. (Sex not stated.)

August 2d. Two issued.

August 5th. One female issued. Some of the eggs hatched.

August 8th. One male issued.

August 9th. More larvæ hatched."

The following descriptions have been drawn up from alcoholic specimens preserved at the Department of Agriculture, some of which have been kindly presented to me by Mr. Howard.

Eggs.—Oval ; one end bluntly rounded, the other conical, slightly flattened above and below. Pure white, very slightly shining, a small, round, yellowish translucent spot in the centre of each flattened side. (The large end is eaten away in all the specimens, by the young larvæ, so I am not able to describe the micropylar region.)

Length 1.8 mm., width 1.5 mm. and 1.4 mm. through the flattened sides. Shell minutely roughened under a half-inch objective, but without marks. Laid in irregular clusters without any covering.

Stage I.—Head and thoracic feet shining black ; cervical shield, leg plates and anal plate, as well as a dorsal patch on joint 13, brown black. Body grayish white with a row of subdorsal segmentary orange spots, diffuse and broad. Warts small, black, each with several hairs, fine, spinulated and rather long. Arrangement of the warts normal (*Psyche* vii, 259), the secondary warts very feebly developed, obscure ; warts iv and v also obscure, vi divided. On the thorax the posterior subdorsal wart (iia) is larger than in *Clisiocampa* and bears several hairs. No secondary hairs. Width of head 1.05 mm.

Stage IV.—Head, cervical shield, joints 12 and 13 dorsally, anal plate and anal feet black ; width of head 3.0–3.2 mm. Body gray, mottled with black, defined in a series of subdorsal dots and narrow lateral line, between which runs a broad orange-red band. Hair fine,

white, rather thick, with a series of little short dorsal tufts. Venter dark gray with a series of black medio-ventral spots. Body quite densely clothed with secondary hairs, the warts almost obsolete, some of the largest ones persisting, black. Leg plates dark.

Last stage.—Head black, the lower segment of clypeus, side pieces and median suture whitish; mouth pale; all covered with soft white secondary hairs; rounded, rather large, not retracted; width 5.5 to 6.4 mm. Body curiously transversely streaked with whitish and red-brown, silky hairy, flattened; no warts. There is a rather broad shaded blackish band below the spiracles, relieved by a series of whitish intersegmental patches below, otherwise grading into the dark venter, mottled with black and light red on each side of the median black patches. Above the substigmatal line the marks are transeverse, except a narrow brown-black broken lateral line which cuts them. The ground color is whitish, shading into bright brown subdorsally, with about six obscured transverse streaks of brown black, most distinct intersegmentally. They become clouded in a dark brown shade centrally on the segment and are relieved by an orange subdorsal transverse dash on the posterior third on joints 4 to 12, a rather conspicuous making, defined before by darker brown; an anterior dark brown ad-dorsal patch. These transverse markings are produced by a growth of fine short dark brown secondary hairs in four transverse lines over the dorsum, a broken blackish dorsal and ad-dorsal shading on the ground of the original broad orange-red subdorsal band. At the lower edge of the orange dash a dark red shade obscurely parallels the longitudinal superstigmatal line. Cervical shield velvety black with two white streaks below it. Anal plates black, joint 12 heavily clouded with blackish. Thoracic feet reddish, abdominal dark, with a bright whitish streak down the outer side. Hair soft, fine, white, tufted dorsally and subventrally centrally on the segments. Warts absent, all the hairs secondary; no perceptible enlargement below the cervical shield; joint 12 not enlarged.

The short brown hairs are stiff thick-walled tubes, smooth with pointed conical ends; they are widest at terminal third and taper a little toward the base, minutely granular-roughened just before the tip. The long white hairs are more slender, colorless, thin walled and smooth, gently tapering toward the tip. There is a slight roughening toward the tip of short lamellar points. Length of the short hairs .4 to .6 mm., of the long ones 3 to 6 mm. The short hairs are evidently of a defensive nature as they become detached when the larva is handled and entering the skin produce some irritation and finally small blisters which last for several days.

Cocoon.—Thin, almost papery, of dark brown silk, single, but with some loose silk without; elliptical, less definite in shape than in *Clisiocampa*, the ends thinner than the central portion. Size 35 x 15 mm.

Pupa.—Robust, the abdomen large, thicker than the thorax, slightly curved ventrally, the anal rounded, pilose, without cremaster, three moveable incisures, viz. 4-5, 5-6, 6-7th abdominal segments (corresponding to joints 8-9, 9-10, 10-11 of the larva) the other incisures behind the 8th abdominal segment distinct, but fixed. Spiracles large, distinct, present on abdominal segments 2 to 8. Cases smooth, compact, firmly united, the joinings marked by darker lines; the leg cases reach to the end of the third abdominal, wing cases to middle of the fourth, antennae cases opposite the end of the fourth segment. Head and thorax pilose, abdomen less distinctly so; cases smooth. Color light reddish brown, the incisures, spiracles and sutures darker. Length 25 mm., width 10 mm.

LITERATURE ON DEFENSIVE OR REPUGNATORIAL GLANDS OF INSECTS.

BY A. S. PACKARD.

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